




California Department of Toxic
Substances Control
Financial Assurance Initiatives for
Hazardous Waste Facilities



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DTSC's Financial Assurance Initiative:

- DTSC initiated the program in 1999 for all RCRA and CA-hazardous waste facilities.
 - Update all closure, postclosure and corrective action cost estimates.
 - Ensure all updated cost estimates are in place
 - Largely completed June 2006.
 - Since Program inception, from 800 million to 1.8 billion in financial assurance.
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Facilities are Required to have Financial Assurance for :

- For Interim Status and Permitted facilities
 - Closure and postclosure of regulated Units
 - Corrective action after remedy selection for permitted and solid waste management units
 - California has over \$1.8 billion dollars in financial assurance for permitted and interim status facilities.
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Adequate Financial Assurance Requires an Accurate Estimate for Each Unit

- An accurate estimate is the foundation of our Financial Assurance Program
 - It is required under RCRA Subtitle C & D and title 22 CCR.
 - A 2001 EPA Inspector General Report indicated that there are deficiencies with how facility cost estimates are derived
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DTSC Cost Estimation Workgroup

- Consists of all DTSC staff that review or develop cost estimates and began in 1999.
 - Assist DTSC reviewers in cost estimate reviews and development.
 - Provide statewide consistency for cost estimates.
 - Provide training and development for DTSC staff.
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To Achieve Accurate Estimates

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- Review and verify facility-derived estimates
 - Develop independently derived estimates
 - Use cost estimation software and other cost data
 - Effectively negotiate with facilities to achieve consensus for accurate estimates
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Our Experience has Shown that the Standard Role of Review and Comment is Not Effective

- Identifying all deficiencies and omissions in an estimate is difficult
 - Facilities tend to minimize DTSC comments with regard to construction operations and costs
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RACER Summary

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- The Software is highly flexible and capable of estimating almost any TSD closure, postclosure and corrective action activity
 - There is good technical support and annual updates/improvements
 - Many common RCRA activities are not built into the program and involve significant modification to existing modules
 - The software is focused primarily on site cleanup/corrective action functions
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CostPro Summary


- This easy to use software was produced primarily to estimate closure and post closure costs at RCRA facilities.
 - The modules are not flexible and do not allow much modification or augmentation
 - Does not allow for corrective action
 - There is no support and the software is not updated regularly
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Department of Toxics Approach






Department of Toxics Approach

- Facilities submit cost estimates as part of permit application, closure plan, permit modification, or DTSC request
 - DTSC has a universe of 162 facilities with cost estimates
 - 159 completed reviews
 - 146 revised estimates have been implemented and in place
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DTSC approach continued...

- Cost estimates are reviewed for completeness
 - Estimates must have tasks broken up into easily defined activities.
 - Activity costs must include a reference or justified basis.
 - Assumptions for activities like sampling\analysis must be based on the approved closure/postclosure plan
 - DTSC staff develop independent estimate using closure/postclosure plan or remedy selection assumptions and industry standard costs.
 - Comparison of the two estimates will generally reveal differences that must be reconciled.
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Independently-Derived Estimates Allows DTSC to

- Better identify underestimated tasks and omissions
 - Provides DTSC staff better documentation and rationale for negotiations with facilities
 - Provides sufficient documentation for DTSC decision-making
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DTSC approach continued..

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- Differences can often be reconciled by examining site-specific conditions, equipment, or operations.
 - DTSC staff will meet with facilities to discuss differences and potential deficiencies with the facility estimate
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DTSC approach continued..

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- DTSC prefers that facility revise its own estimate as the result of DTSC comments and mutual discussions.
 - DTSC will move forward with DTSC derived estimate if facility is unwilling to revise the facility estimate to address DTSC concerns.
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Obstacles

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- Poor basis such as inadequate closure or postclosure plan
 - Unique facility operations/equipment-no models/examples to use
 - Recalcitrant facility
 - Inadequate internal support
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Overcoming Obstacles

- Make conservative and generic assumption for facilities that lack adequate detail in closure/postclosure plans
 - Well trained and informed staff can work with difficult facility operations and representatives
 - Keeping management well informed throughout cost estimate cycle
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Summary of DTSC's Approach - Implementation

- Ideally estimates are approved as part of a permit action – new, renewal, class 2/3 mod
 - Don't wait - facility submits Class 1* mod or DTSC uses agency-initiated mod process
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Summary of DTSC Approach

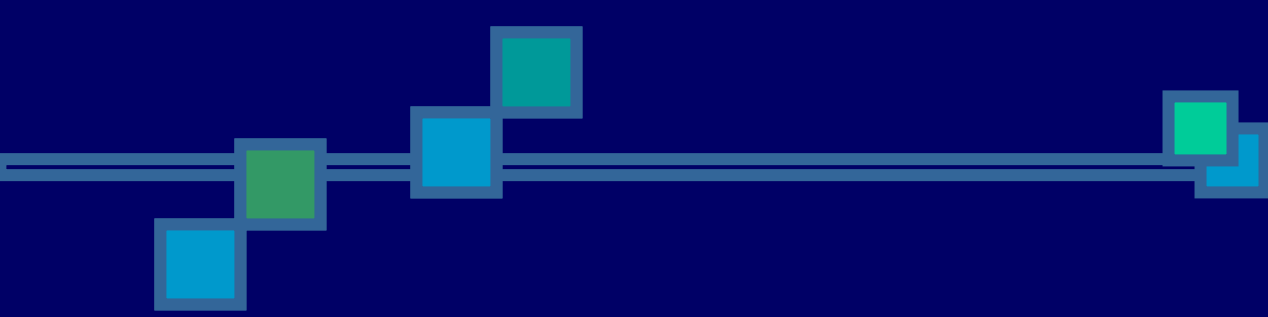
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- DTSC staff review facility cost estimates
 - DTSC staff complete independent estimate
 - Reconcile differences between estimates
 - If differences cannot be reconciled – use DTSC estimate
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Keeping Management Informed

Each Branch updates a spreadsheet monthly that includes:

- Their universe of facility cost estimates.
 - Critical data such as the previous estimate, revised estimate, type mechanism, and other notes.
 - Tracking milestones such as revised estimates, facility negotiations and how the estimate will be incorporated in to the permit or order.
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POSTCLOSURE CARE PERIOD






CURRENT APPROACH

To determine postclosure care period and needed funding:

- DTSC initially uses a thirty year postclosure care period for facilities where waste remains in place after closure.
 - This thirty year period is reviewed and can be reset to thirty years during permit renewal – every ten years, “rolling 30-year PC period.”
 - For other facilities, such as corrective action, that require PC or long-term O&M, period is based on site-specific factors (such as length of time to remediate plume).
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PROBLEM WITH CURRENT APPROACH

- At any point in time a land disposal facility has only between 20 and 30 years of financial assurance to cover ongoing postclosure care costs that will continue much longer.
 - If the company declares bankruptcy or becomes non-viable, the waste generators are forced to pay for the remaining postclosure costs or public could be used.
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POSTCLOSURE BEYOND 30 YEARS WOULD LIKELY INCLUDE:

- Groundwater/surface water monitoring,
 - Cover and drainage maintenance,
 - Inspections and administration,
 - Operation and maintenance of leachate/groundwater/vapor extraction and treatment systems,
 - Replacement of closure structures such as covers, drainage, wells, treatment systems,
 - Some activity costs will decrease over time.
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Extended Postclosure Estimate Examples

- IT Panoche facility is a large 100 acre landfill with leachate collection and limited groundwater remediation.
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EXAMPLE 300 YEAR ESTIMATE

IT LANDFILL - POSTCLOSURE COST ESTIMATES

ANNUAL OPERATION, MONITORING AND MAINTENANCE (per year)	Year 1-10	Year 11-30	Year 31-300
Inspections - weekly	\$30,000	\$30,000	\$30,000
Well Maintenance	\$7,000	\$7,000	\$7,000
Leachate/Groundwater treatment	\$158,000	\$145,000	\$75,000
Soil Vapor Treatment	\$100,000	\$25,000	\$0
Management, Office Support, Supplies, fuel, vehicles, utilities, fees	\$100,000	\$85,000	\$75,000
Groundwater Monitoring	\$140,000	\$105,000	\$70,000
Liability/Corporate Insurance	\$300,000	\$300,000	\$300,000
Accounting/Administrative	\$30,000	\$30,000	\$30,000
<i>Contingency of 20%</i>	\$173,000	\$145,400	\$117,400
ANNUAL TOTAL	\$1,038,000	\$872,400	\$704,400

EQUIPMENT REPLACEMENT

(recurring every 20, 30, 150 years)

20 year schedule

electrical system	\$375,000
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office space	\$75,000
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pipng for hypersaline h2o	\$200,000
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20 year year total	\$650,000
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20 year year total over 300 years (15 times)	\$9,750,000
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30 year schedule

evaporative ponds	\$2,000,000
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tanks	\$600,000
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seismic damage for cover systems -	\$6,000,000
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(10% of installation cost)

30 year year total	\$8,600,000
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30 year year total over 300 years (10 times)	\$86,000,000
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100 year schedule

cover system replacement	\$15,000,000
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100 year year total over 300 years (3 times)	\$45,000,000
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Equipment Subtotal

\$140,750,000




TOTAL COSTS FOR 300 YEARS




Summary of costs

AVERAGE ANNUAL COSTS	\$726,720
20 YEAR COSTS (recurring)	\$650,000
30 YEARS COSTS (recurring)	\$8,600,000
150 YEAR COSTS (recurring)	\$15,000,000
300 YEAR TOTAL	\$358,766,000





Projecting Costs into the Future Definitions and Assumptions

- Money over time makes money. i.e., Interest
 - The government or private parties will pay you to borrow your money. Highly variable over time and type of investment/risk. The low risk U.S. Treasury bond rate has ranged from 3-13% annually over the last 50 years.
 - Costs over time increase. i.e., Inflation
 - There are many measurements for inflation, but Consumer Price Index (CPI) is most common. This has ranged from 1.5 to 3.0% over the last ten years and from -2.01 to 17.86% over 100 years. Deflation and high inflation are rare but do happen.
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Definitions and Assumptions

continued..

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- **Discount Rate** is = [**Interest** – **Inflation**].

Also known as a “real rate of return” as it measures the extra money earned by interest beyond what is needed for spending as prices go up over time due to inflation. It is commonly used for planning long term projects that involve expenditures and investments. It is used in the fields of engineering and economics.



Examples using 2005 rates :

Treasury bond rate – CPI = conservative discount rate

$$5\% - 2.5\% = 2.5\%$$

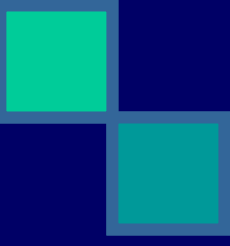
High yield security rate – Retail Price Index = “high roller” discount rate

$$12\% - 2.3\% = 9.7\%$$


Treasury Inflation Protected Security pays a rate of return plus the current rate of the CPI. It is basically a discount rate from the government. It is 2% right now for a 10 year period. It is guaranteed. It has varied from 1.5 to 2.5 over the last few years.



Definitions and Assumptions continued..



Net Present Worth = The amount that a future sum of money or expenditures is worth today given a specified rate of return.

- e.g., An investment that earns 10% per year and can be redeemed for \$1000 in five years would have a present value of \$620.
 - e.g., In other words, \$620 today is worth \$1000 in five years. Similarly If you had a \$1000 payment due in five years, you could pay it off today for \$640.
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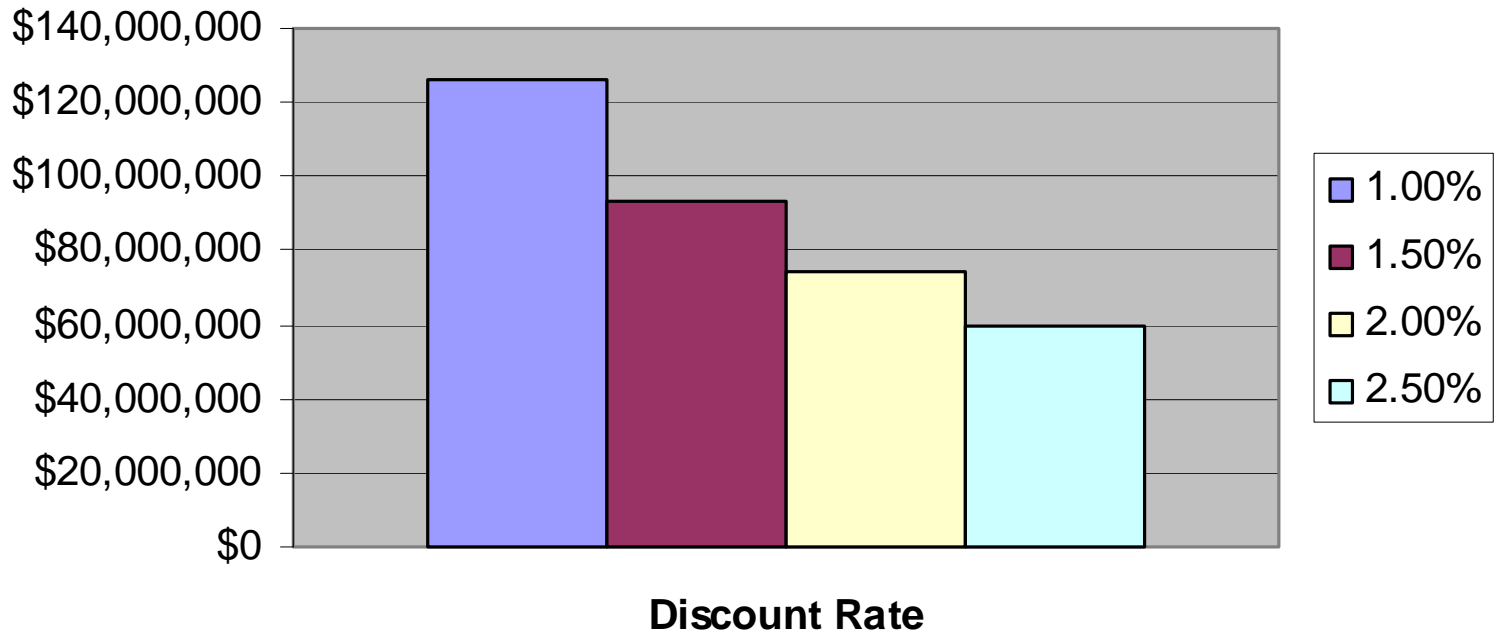
Net Present Worth for the 300 Year Estimate

Discount rate of 1.0%	1.00%
30 YEAR PRESENT WORTH	\$31,096,281
50 YEAR PRESENT WORTH	\$40,480,226
100 YEAR PRESENT WORTH	\$66,907,970
300 YEAR PRESENT WORTH	\$126,236,528
Discount rate of 1.5%	1.50%
30 YEAR PRESENT WORTH	\$28,708,126
50 YEAR PRESENT WORTH	\$36,178,223
100 YEAR PRESENT WORTH	\$61,741,966
300 YEAR PRESENT WORTH	\$93,179,352

Net Present Worth for the 300 Year Estimate continued...


Discount rate of 2.0%	2.00%
30 YEAR PRESENT WORTH	\$26,614,238
50 YEAR PRESENT WORTH	\$32,543,434
100 YEAR PRESENT WORTH	\$52,187,382
300 YEAR PRESENT WORTH	\$73,901,151
Discount rate of 2.5%	2.50%
30 YEAR PRESENT WORTH	\$24,762,558
50 YEAR PRESENT WORTH	\$29,449,312
100 YEAR PRESENT WORTH	\$44,949,524
300 YEAR PRESENT WORTH	\$60,055,152

300 Year Net Present Worth for IT Facility







Conclusions

- Postclosure structures and systems require maintenance and replacement over time or they will fail.
 - Although groundwater monitoring can decrease over time, depending on site conditions, a minimum level of groundwater monitoring will be necessary as long as waste remains in place.
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Conclusions continued..

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- Some activities could end completely, such as groundwater remediation and gas extraction, depending on site data.
 - Investment now in financial assurance for long-term postclosure care will cost less money and involve less risk than waiting for 10 or more years.
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CONTACT INFORMATION

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